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POSTER ABSTRACT

What do birds want?
Multi-scale analysis of visitation rates to urban trees

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The growth of cities is a continuing trend, with dramatic implications for biodiversity. As the area and intensity of urbanisation increases, sustaining urban biodiversity has been shown to have measurable benefits for nature conservation, as areas of high conservation value and threatened species are increasingly being found in towns and cites. The maintenance of urban biodiversity has also been shown to provide measurable benefits to human individual and community health and wellbeing.

Urban tree populations are often low in diversity, with a high proportion of exotic species. While they are a prominent part of town planning, their role as a part of the urban ecological landscape remains poorly understood. As such, they offer a novel avenue of research, and a greater knowledge of how to best manage urban tree plantings within a wider ecological landscape framework has the potential to provide benefits to urban avian communities.

As part of a larger urban tree research project, we collected observational data documenting bird visitation rates to 40 individual trees in the city of Dunedin, New Zealand, over 12 months. A number of landscape characteristics on multiple spatial scales were then used to place these trees within a larger landscape context. A model averaging approach was used to assess the relative importance of these variables in predicting the bird species richness observed in each tree, as well as the visitation rates of several individual bird species and functional/taxonomic guilds.

When modelled without wider landscape variables, tree species and size were found to be significant factors in determining the observed bird species richness. However when these wider landscape features were incorporated into the analyses, tree species and size were among the lower ranked predictors. For total bird species richness, the distance to the nearest forest patch, and the maximum building height and area of mown grass in the vicinity (30m radius) of the trees were the most important predictor variables. For native bird species richness, however, the area of low vegetation (<2m tall) and the number of tall tree crowns (>5m tall) in the vicinity of the trees, in addition to the distance to the nearest patch were the highest ranked predictors.

The different bird species and guilds showed highly individualised responses in their visitation rates. For example, native nectivores showed the strongest response to the area of low vegetation surrounding the trees, and distance to the nearest patch. For introduced Dunnocks, on the other hand, the surrounding building footprint clearly stood out as the highest rated predictor variable. Larger scale landscape classifications from previous mapping projects were not found to be important for

most bird species.

Our results suggest that while the choices of tree species can be important for encouraging urban bird communities, the local context in which they are situated can have a major impact on their biodiversity value. The management of urban trees should focus on providing a wider diversity of trees, and also consider the context in which they are situated to maximise the potential benefits to urban biodiversity.